

WHAT IS CLAIMED

1. An optical network, comprising:  
an optical ring;  
a plurality of local nodes coupled to the optical ring;  
each local node of the plurality of local nodes configured to receive traffic at an assigned wavelength, disparate from wavelengths assigned to other local nodes;  
and  
a data center node coupled to the optical ring and operable to receive traffic from the plurality of local nodes, sort at least some of the traffic by destination, and transmit the traffic to a corresponding destination node at the assigned wavelength for that node.
2. The optical network of Claim 1, wherein at least some of the traffic comprises a request for data and the data center node is operable to retrieve the data.
3. The optical network of Claim 1, wherein the optical ring comprises bi-directional pathways.
4. The optical network of Claim 1, wherein the plurality of local nodes are further operable to pass through traffic at wavelengths disparate from assigned wavelengths without optical-to-electrical conversion.
5. The optical network of Claim 1, wherein the data center node comprises a switch operable to selectively pass the traffic to a transmitter transmitting at the assigned wavelength.
6. The optical network of Claim 1, wherein the data center node comprises a services module operable to process a request for data and provided the requested data.
7. The optical network of Claim 6, wherein the requested data comprises audiovisual content.

8. The optical network of Claim 1, wherein at least one of the plurality of nodes is a hub node operable to selectively pass and terminate individual traffic streams.

9. The optical network of Claim 8, wherein the hub node is a first hub node and is coupled to a second hub node associated with a second optical ring.

10. The optical network of Claim 9, wherein the destination node is located on the second optical ring.

11. A data center node, comprising:
  - a plurality of receivers operable to receive traffic including information identifying a destination node;
  - a data center operable to selectively pass the traffic to a transmitter associated with the destination node; and
  - a plurality of transmitters operable to transmit the traffic at a wavelength assigned to the destination node.
12. The data center node of Claim 11, wherein the data center comprises a switch operable to selectively pass the traffic to a transmitter transmitting at the assigned wavelength.
13. The data center node of Claim 11, wherein the data center comprises a services module operable to process a request for data and provide the requested data.
14. The data center node of Claim 13, wherein the requested data comprises audiovisual content.

15. A method of transmitting traffic in an optical network, comprising:  
receiving traffic from a plurality of local nodes at a data center node coupled to an optical ring;  
sorting the traffic by destination node;  
transmitting the traffic at a wavelength assigned to the destination node; and  
receiving traffic at the destination node at the assigned wavelength and passing through traffic not at the assigned wavelength.

16. The method of Claim 15, wherein the assigned wavelength is disparate from wavelengths assigned to other local nodes.

17. The method of Claim 15, wherein the traffic comprises a request for data.

18. The method of Claim 17, further comprising transmitting the requested data to the destination node.

19. The method of Claim 15, further comprising:  
transmitting traffic in a first direction in the optical ring; and  
transmitting traffic in a second direction in the optical ring.

20. The method of Claim 15, further comprising selectively positioning a set of switches in each local node to provide protection switching in response to a fault occurring in the optical rings.

21. The method of Claim 15, further comprising dropping traffic to a second optical ring.

22. The method of Claim 21, wherein the destination node is located on the second optical ring.

23. A system for transmitting traffic in an optical network, comprising:  
means for receiving traffic from a plurality of local nodes at a data center node coupled to an optical ring;  
means for sorting the traffic by destination node;  
means for transmitting the traffic at a wavelength assigned to the destination node; and  
means for receiving traffic at the destination node at the assigned wavelength and passing through traffic not at the assigned wavelength.
24. The system of Claim 23, wherein the traffic comprises a request for data.
25. The system of Claim 24, further comprising a means for providing and transmitting the requested data to the destination node.
26. The system of Claim 23, wherein the optical ring comprises a first and a second optical ring, further comprising means for selectively switching traffic from one ring to the other ring.

27. An optical network, comprising:

an optical ring;

a plurality of local nodes coupled to the optical ring;

each local node of the plurality of local nodes configured to receive traffic at an assigned wavelength, disparate from wavelengths assigned to other local nodes and operable to pass through traffic at wavelengths disparate from the assigned wavelength without optical-to-electrical conversion; and

a data center node coupled to the optical ring and operable to receive traffic from the plurality of local nodes including request for data, provide the requested data, sort at least some of the traffic by destination, and transmit the traffic to a corresponding destination node at the assigned wavelength for that node.

28. An optical network, comprising:

an optical ring;

a plurality of local nodes coupled to the optical ring;

each local node of the plurality of local nodes configured to receive traffic at an assigned wavelength, disparate from wavelengths assigned to other local nodes; and

a data center node coupled to the optical ring and operable to provide centralized storage applications through a service module, receive traffic from the plurality of local nodes including request for data, provide the requested data, sort at least some of the traffic by destination, and transmit the traffic to a corresponding destination node at the assigned wavelength for that node.

29. An optical network, comprising:  
an optical ring;  
a plurality of local nodes coupled to the optical ring;  
each local node of the plurality of local nodes configured to receive traffic at an assigned wavelength, disparate from wavelengths assigned to other local nodes;  
a primary data center node coupled to the optical ring and operable to receive traffic from the plurality of nodes, store data from at least some of the traffic, sort at least some of the traffic by destination, transmit the sorted traffic to a corresponding destination node at the assigned wavelength for that node, and transmit a copy of the stored data to a back-up data center node; and  
the back-up data center node operable to receive and store the copy of the stored data transmitted by the primary data center node in response to a back-up event, receive traffic from the plurality of nodes, sort at least some of the traffic by destination, and transmit the sorted traffic to a corresponding destination node at the assigned wavelength for that node.

30. The network of Claim 29, wherein at least some of the traffic comprises a request for data and the data center node is operable to retrieve the data.

31. The network of Claim 30, wherein the plurality of nodes are further operable to pass through traffic at wavelengths disparate from assigned wavelengths without optical-to-electrical conversion.

32. The network of Claim 31, wherein at least one of the plurality of local nodes is a hub node operable to selectively pass and terminate individual traffic streams.

33. The network of Claim 32, wherein the hub node is a first hub node and is coupled to a second hub node associated with a second optical ring.

34. The network of Claim 33, wherein the back-up data center node is located on the second ring.

35. A method of transmitting traffic in an optical network, comprising:  
receiving traffic from a plurality of local nodes at a primary data center node  
coupled to an optical ring;  
storing data from at least some of the traffic at the primary data center node;  
copying the stored data;  
transmitting the copy of the stored data at a wavelength assigned to a back-up  
data center node;  
receiving the copy of the stored data transmitted by the primary data center  
node and passing through traffic not at the assigned wavelength; and  
storing the copy of the stored data at the back-up data center node.

36. The method of Claim 35, wherein receiving and storing the copy of the  
stored data is in response to a back-up event.

37. The method of Claim 36, further comprising:  
receiving a request for stored data for a destination node; and  
transmitting some of the stored data at a wavelength assigned to the  
destination node.

38. The method of Claim 35, wherein the wavelength assigned to the back-  
up data center node is disparate from wavelengths assigned to other nodes.

39. The method of Claim 35 further comprising:  
sorting the traffic by destination node;  
transmitting the traffic at a wavelength assigned to the destination node and  
disparate from the a wavelength assigned to the back-up data center node; and  
receiving traffic at the destination node at the wavelength assigned to the  
destination node and passing through traffic not at the wavelength assigned to the  
destination node.



40. The method of Claim 35, further comprising selectively positioning a set of switches in all nodes to provide protection switching in response to a fault occurring in the optical rings.